MSRTPLC
IDEATING WORKSHOP
ON
APPROPRIATE AND SUSTAINABLE TECHNOLOGIES FOR RURAL AREAS

19 - 20 MARCH 2015

EMPOWERING RURAL PEOPLE
SIRD MEGHALAYA
STATE INSTITUTE OF RURAL DEVELOPMENT

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PREFACE

The Government of Meghalaya has decide to establish the Meghalaya State Rural Technology and Livelihood Promotion Centre (MSRTLPC) at Nongbah Myrdon, Ri Bhoi District, with an aim to induct, collate, incubate and disseminate appropriate rural technologies and to promote rural livelihoods by skilling the rural youth in appropriate rural technologies.

The initiative was made possible due to the generosity of the people of the village led by the Headman named Shri. Biplob Thangkhiew. The State Institute of Rural Development (SIRD) made it all happen.

The project, however, needs to be carefully planned and designed so that it becomes a worthy model for replication not only in the State of Meghalaya but the North Eastern Region and the Country as a whole. Therefore, it was felt that an Ideating Workshop should be organized to facilitate better identifications of appropriate technologies for rural areas that can be immediately grounded at the MSRTLPC.

It gives me immense pleasure to state that the Workshop has generated several ideas. I express my sincere thanks to the SIRD team for organizing the Workshop.

Sd/-
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Principal Secretary
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PREFACE

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Introduction:

The Government of Meghalaya has decided to establish the Meghalaya State Rural Technology and Livelihood Promotion Centre (MSRTLPC) at Nongbah Myrdon in Ri Bhoi District. The Centre is conceptualized to develop, demonstrate and disseminate and induct appropriate and sustainable rural technologies for development of the rural areas and promotion of entrepreneurship and livelihoods. Further, the MSRTLPC will also emerge as a major skilling centre for the rural youth of the state, in appropriate rural technologies so they can obtain skilled jobs in their own state without having to undergo the trauma of migration.

The Meghalaya State Rural Technology and Livelihood Promotion Centre will source, collate, showcase, demonstrate, incubate, disseminate and induct appropriate rural technologies, in close partnership with the technology providing institutions of the State and the Centre as also the rural innovators. Initially the MSRTLPC will focus on Rural Housing and Infrastructure, Water and Sanitation, Rural Energy and post harvest technologies. The dream is to go beyond the state of Meghalaya, and be available for the entire North Eastern region and the Country. The Centre will serve as a catalyst so that productivity increases, the quality of life is enhanced and the rural areas of Meghalaya will move towards sustainable livelihoods and become self reliant.

Establishing partnerships and networks with reputed technology developers, individuals and institutions for knowledge sharing will be an integral part of the Centre. For this purpose institutions and individuals engaged in research and development of technology, end-users, financial institutions, NGOs and others will be invited to collaborate and participate actively based on the respective areas of specialization and service that can be rendered by them. It is eventually visualized that the Centre will emerge as a one-stop shop for rural development technology solutions. To enable the Government of Meghalaya to establish the Centre on a sound footing it is felt that an ideating workshop be organized for evolving a clear roadmap, with the following objectives.

1. To evolve a roadmap for establishing the MSRTLPC

2. To identify the appropriate technologies available for Meghalaya and for grounding in MSRTLPC
3. To establish network and organic linkages with technology developers, institutions and individuals

Themes: The themes identified for the workshop are:

1. **Drinking Water and Waste Water Management :** Water is a scare but one of the most important natural resource that sustains life on earth. Clean and safe drinking water is crucial for improving the health condition of the rural people and a healthy society grows at a faster pace. Efficient water treatment, effective recycling of wastewater for other household and farm activities is a major intervention that would greatly help to maintain a hygienic and clean environment and augment productivity.

2. **Sanitation:** Sanitation in rural areas has been one big challenge. Even after much effort there still exist open defecation, poor waste disposal and unhygienic living conditions in the rural areas. The lack of proper sanitation has been one of the major causes for poor health and spread of diseases in the villages. Technological intervention plays a crucial role for improving sanitation status in the country.

3. **Rural Energy:** Affordable and reliable energy brings amenities and enhances the opportunities for rural industry. There are a large number of renewable and non-conventional energy source that are being tapped efficiently for various uses in the rural areas like illuminating homes, operating electronic devices and farm activities. Availability of energy can improve living conditions significantly.

4. **Waste Management:** Human activities create waste and waste has to be reduced, reused and recycled and managed effectively to reduce pollution and control the detrimental effects to life and the environment. Waste in rural areas mainly comprise of agricultural waste, household and animal waste. Besides these plastics and other forms of non-biodegradable waste are also becoming a menace in rural areas. Technologies have been developed to treated and recycle these wastes into other useful products for fuels, compost etc.

Proceedings of the workshop:

The workshop was inaugurated by Mr. K.N.Kumar, IAS, Principal Secretary, C & RD, Department In his inaugural address, Mr. Kumar welcomed all the participants and expressed his gratitude to all for participating at the Workshop. He informed the participants that working for the development of the North East region of the country is a different ball game all together and there is much scope for innovation due to its diversity and heterogeneity. Every 50 km of the region has a different language and culture and considering the genetics and environment pose great challenges that have to be overcome. The NIRDPR, Hyderabad has established a Rural Technology Park that sources available technologies for rural areas. For example, with respect to rural housing it has sourced different housing designs using different material in the respective regions. In the sanitation sector also there are different technologies that are being show case at the RTP.

Within the North East there are different technologies that are available. It is important to source all these technologies and refine them. A very bright Headman of Nongbah Myrdon has offered land free of cost for setting up a Rural Technology Park in the State. This Workshop is where intellectuals can shake hands with the laymen and provide a platform where one can stimulate the thought process and think beyond the system.

The Meghalaya State Rural Technology and Livelihood Promotion Centre (MSRTLPC), comprises of two parts:

1. To source the different technologies available in the region and
2. To establish a Livelihood Promotion Centre is to promote and improve livelihoods of the rural people through these technologies.

The pure knowledge existing with the scientists should be translated into applicable technologies that people can use effectively to improve the quality of life. There are rural innovators but the lack of resources and critical mass to make it to the next level has hampered their progress. The technologies developed by these local innovators will be identified and brought to the Centre. The Centre will also act as a platform for innovations. The Principal Secretary appealed to the participants to identify about 30 to 40 technologies that could be grounded immediately at the MSRTLPC. He also stated that this is not a onetime workshop but the beginning of a long term relationship.

Keynote Address:

Case for Establishing a Rural Technology Centre in Meghalaya by Ashok Madhukar:

Mr Madhukar in his keynote address mentioned that more than 80% of the people live in the rural areas and a large number of the villages in the state and the region fall under the category of small villages having only about 50- 100 households. It is very difficult to find villages that have more than 200 households. The connectivity by roads, water and sanitation is also poor. There is a need to look at the geographical dimension, address disparities and improve the quality of life. Technology has a key role to integrate geographies, reduce disparities and improve quality of life for the rural population. The rural population is viewed purely as a market at the bottom of the pyramid and are being exploited. Therefore there is a need to empower them by technologies that create improved social infrastructure and livelihood opportunities. The thrust to improve the quality of life would be on access and ability to use appropriate technologies that are compatible with social ethos, add value to local produce, skill enhancing and improve social infrastructure. With regard to technology usage, he stated that it should be demand driven coupled with affirmative action to reach out to people, understand their needs and assist them with technology solutions.

There are number of rural micro enterprises with investment of less than Rs 5 lakhs and therefore there is a need for cluster development. Technologies for development of these enterprises should be replicable, standardized and easy.

Conceptualising Technology Bank -Making It Happen in Meghalaya by Dr. R. M. Prasad:

Dr R. M. Prasad started by saying that the Technology Bank or Te Bank is an extension of RTP. While the RTP compiles and showcases proven technologies developed by various Technology Providers like ICAR, CSIR, S & T institutions, NGOs, grass root innovators and focuses on the demonstration of appropriate and sustainable technologies in the field, the Te Bank will facilitate out-of-box thinking and creativity of rural innovators for viable technologies by providing corpus fund, develop linkages with various agencies for technology flow, action research for technology validation and commercialisation of low end technologies for solving immediate problems of rural people. The earlier attempts for establishing a Technology Bank is Nayudamma Technology Bank of IDRC, Canada with the objective to develop, test and distribute appropriate technologies for improved livelihoods.

NIRD, Hyderabad developed a detailed concept note on Te Bank and organised a Consultative Workshop during October, 2008 and the main objective was to integrate agriculture, industry and commerce for promotion of livelihood. However this did not materialise due to lack of conviction of concept and absence of a road map.

The vision of the Te Bank is to develop as an institution that supports sustainable livelihood, poverty alleviation and inclusive development of Rural and Urban India by ensuring access to technologies. It will also integrate efforts of various ministries and bridge the gap between Researchers, Policy Makers, Industry, Financial Institutions and End Users for proper flow of technologies. It should also have a supporting platform for state-of-the-art ICT and multi-media devices for technology dissemination and connected services.

The mission is to preserve proven traditional wisdom and mainstream informal grassroots rural innovations (technology solutions, processes and best practice models) of diverse rural stakeholders. It should also connect rural development efforts of diverse institutions, organizations and ministries of Government of India and prospective technologies for creating sustainable rural livelihoods.

The process is to develop state-of-the-art technology & management framework, comprehensive knowledge repository of innovative technologies, database of techniques, processes and change management practices. The Te Bank will provide extension and advisory services related to technologies on need basis, technical contents through multimedia, personalized data base, multi-lingual interfaces and fee based services.

The purpose of developing a Te Bank is to ensure faster multiplication and dissemination of proven technologies to end users thereby triggering the growth process, create knowledge flow from Te Providers to end users and create market and financial linkages for technology adoption. The Te Bank will also help in selecting appropriate traditional technologies for conservation, rejuvenation, dissemination and commercialization. Networking will also be made possible through the Te Bank. Te Bank will bring all the carriers of technology in a single platform (single window technology delivery).

There is silent revolution of innovations happening in rural areas at grassroots level, which needs to be tapped. Grass root innovators (GRI) are basically ingenious solutions developed locally to address system challenges in the long run for improving rural livelihoods and promote sustainability. Access to time tested and creative GRIs is necessary for enhancing

technology creation. National Innovations Foundations under Department of Science and Technology works with a mission to strengthen GRIs and promote traditional knowledge.

The steps to set up the Te Bank would start with mapping of technologies and Te providers, consulting and creating partners for technology dissemination, developing technological and functional frame work, conducting consultative participatory workshops with different actors, including GRIs. There should also be a proper governance structure and organizational form. Identifying and mobilizing funds and creating linkages with financial and marketing agencies are also essential. Technology commercialization process and livelihood improvement of the end users should also be taken care of.

Te Bank has much relevance in the present scenario of Science, Technology and Innovation Policy (STIP) of GoI where the thrust is given to innovations under National Innovation Council and State Innovation Councils. SIRD, Meghalaya can take a lead in establishing Te Bank as an innovative project under State Innovation Council, promoting GRIs and a model for other NE states.

In conclusion, the Te Bank need not be created as a Government entity and can be promoted as a Company (Section 25). It can be built up on a successful RTP, and act as an extension of RTP for value added services. It can serve as acid test of market, self-sustainability and livelihood improvement, provide sustainable and viable options to diversify anti-poverty portfolios, ensure enhanced rural efficiency and rural entrepreneurship.

The Rural Technology Park at NIRD- an experience by Dr P. Sivaram

Dr Sivaram narrated his experience of working with RTP at NIRD, Hyderabad and explained that RTP is a place to showcase and demonstrate a variety of rural technologies. It is also a Training cum Production Centre to promote skill development and entrepreneurship. The RTP works on a PPP model (Public Private Partnership) and is an instrument in disseminating appropriate and affordable rural technologies to villages. Better use of local resources for cost effective rural housing and renewable energy and natural resource management are some of the major focuses.

The outputs of the RTP are:

1. Sustainable livelihoods
2. Employment Generation

3. Women Empowerment
4. Enhancement of Economic status
5. Poverty Reduction

The components of RTP Hyderabad are as follows:

1. Farm Technologies
2. Non - Farm Technologies
3. Renewable Energy
4. National Rural Building Centre (NRBC)
    a. Cost Effective Housing Technologies
    b. Sanitation models

The technologies selected are based on their Innovativeness, appropriateness, affordability, adoptability, marketability, ability to generate employment opportunities, utilization of local resources and eco-friendly technologies.

Inducting Technology – Village needs and perspective by Shri Biplop Thangkiew (Headman of Myrdon Nongbah)

Shri Thangkiew started by saying that it is a great opportunity, as a small village headman, from one of the backward districts in Meghalaya, to be present and address the needs and perspective of Nongbah Myrdon village with regard to the Rural Technology Park. Nongbah Myrdon has 180 households out of which only 13 households have members who are government employees. It was felt that the economic factor is one of the major obstacles for the development in the village. In the year 2012, the village Executive Committee formed 18 groups where each group comprises of 10 households. The plan is to allot different income generating activities to each group with an objective to generate employment and enhance livelihood. Though MGNREGA has greatly helped in solving the unemployment problem and control migration during 2010-11, over dependence on this scheme will not enhance livelihoods to a desired level. Therefore, these groups have been formed to take up various income generating activities like leaf plate making, recycled paper, food processing etc.

For better functioning of the groups, capacity building and training of these groups is essential. He stated that, during his visit to the RTP at NIRD Hyderabad he has observed and learned that there are various activities that these groups can take up. However, the RTP at

Hyderabad functioned only as a demonstration Centre. Therefore, it was felt that the MSRTLPC should not only be established to showcase technologies for demonstration purposes but it should also help to promote livelihood activities for the villagers and where people can actually see live demonstrations and the actual application of these technologies for income generation. The MSRTLPC and its activities together with the participation of the people should set an example to the surrounding villages, the state and the NE region as a whole.

At present the people of Nongbah Myrdon still depend on the forests for their fuel needs that is detrimental to the environment. There is a company at Ri Bhoi district called Meghalaya Agrovet that is rearing poultry for meat and eggs and lots of litter is being generated daily. Mr. Thangkhiew therefore proposed that biogas plant should be set in all localities of the village to control deforestation.

The village has also earmarked 5 hectares for establishing a herbal plantation and 3 acres for CDP convergence with MGNREGS for planting castor because to the potential that is available.

The other need of the village is power. Since the village has a number of water sources and streams we can explore the possibility of generating hydro power like hydro jar and micro hydro project.

Technological Induction and Innovative Projects in Meghalaya – by Shri B.S.Rumnong

Shri B.S. Rumnong in his presentation stated that in Meghalaya there are numerous indigenous technical knowledge (ITK) such as cane and bamboo, weaving, construction, drip irrigation, stone masonry, silk weaving, pineapple fibre extraction & weaving and blacksmithy and some of these ITKs are dying and need to be revived as they are unique to the state and have market potential. In Meghalaya adoption of technology is slow and not widespread and is limited to trials and demonstration. Dissemination of technology is weak and not coordinated. Capacity Building efforts for widespread dissemination of technology needs to be systematized.

The technologies promoted in Meghalaya are vermi composting which is widely practiced, bio mass driers by using briquettes and charcoal, hydraulic ramp pump, TERAFIL

and Membrane water Filtration which remains at demonstration level, waste paper recycling, stabilized mud block, low cost oven, solar home lighting, zero energy cold storage, low cost sanitation technologies, and pine needles briquetting used as fuel for cooking.

The state government has also taken the initiative to implement special projects like the bio-fuel project and installation of biodigesters. Bio fuel crops used for oil extraction from the harvested seeds of *Pongamia pinnata* which have 30% oil content and *Hodgsonia reticulata,* (Sohmyntar) having 60% oil content. It is proposed that about 150 bio digesters would be installed in three C & RD Blocks of the state. A pilot project for installation of 7 bio digester plants is under progress at Nongbah Myrdon village.

Open House –Setting the Goals for the workshop: chair Mr K. N. Kumar, IAS, Principal Secretary, C & RD, Government, Meghalaya

Shri K. N Kumar initiated an open house discussion for setting the goals of the workshop. One of the participant suggested that technologies related to agriculture should be displayed and demonstrated at the RTP like seeding machine or tillage system. Innovative farm machineries and energy efficient machineries should also be inducted. Taking a cue from this suggestion the headman of Nongbah Myrdon stated that ploughing of the field using the manual traditional method was time consuming and difficult. He mentioned that he had studied various types of ploughs but did not find one that was suitable for attaching to the power tiller and therefore suggested that such a plough be designed and developed.

Mr Ricky Renthlei from Bethany Society stated that the Society has a Rural Technology Park at Tebronggre in Rongram C & RD Block that has been adjudged as one of the best in India by the Department of Science & Technology. He also stated that development of technology should consider factors relating to nature.

During the discussion, the cultivation of broom grass was raised by Mr Thomas Mallai of Bosco Integrated Development Services. He stated that only 25% of the broom grass i.e the flower is harvested and the remaining portion is destroyed by burning. This practice has a disastrous impact on soil health and fertility. From one truck of broom flowers harvested, there is about 10 trucks of stalk that is left over and burnt. Solutions and technologies to utilize this left over for construction or other useful purposes may be explored. Mr Mallai also

opined that the broom seeds are also highly inflammable and is probably due to high oil content. Mr Remdor Dkhar, HDO, West Khasi Hills mentioned that broom is a heavy feeder and is not recommended for cultivation in fertile soils. However, it can be used for soil conservation and can be planted on road sides or steep slopes to prevent soil erosion. Mr Renthlei also added that the sap at the end of the stalk has been traditionally used as a medication for eye problems. Hence, its medicinal properties can also be assessed.

Decisions Taken based on the Open House Discussion:

- A visit to the RTP run by Bethany Society should be planned immediately. The visiting team will comprise of officers to study how it was conceptualized.
- Commission a study to customize attachment of a mould board to the power tiller so that it can also be used in winter when the soil is dry and hard.
- Directorate of Oilseeds Research, Hyderabad can be approached to examine the oil content of broom seeds.
- Explore the possibility of converting broom grass clumps to resources for building etc.
- Explore the medicinal value of broom grass sap

Technologies developed by Appropriate Rural Technology Institute (ARTI) –by Shri Narendra Zende

Mr Zende made a presentation on the activities of ARTI, Pune and highlighted the various technologies developed by his Institute.

After his presentation the following decisions were taken:

1. MSRTLPC will consult Mr Zende for cultivation of strawberries using raised beds technology.
2. To collect the various models of improved cook stoves, Sarai stoves and cooker system from ARTI on cash-on-delivery basis.
3. A quick study visit on leaf plate making by DHRITI, Barpeta should be undertaken.
4. Meghalaya Institute of Entrepreneurship team led by Project Director, DRDA Ri Bhoi will visit ARTI.

Zero Energy Ice Making and Energy Efficient Technologies: TreeLabs, Indian Institute of Technology,Mumbai by Dipankar

Dipankar provided an introduction to the activities of TreeLabs and stated that major focus of the organization was to invent the inventors, create entrepreneurs and enrich the world. He mentioned that a lot of the conventional equipment and machinery that is being used are energy inefficient. He provided an example that in conventional welding about 200 amps is needed while one can melt 100 kg of metal on the desktop by induction method. He demonstrated a handheld welding machine that was invented by TreeLabs that uses the regular 5 amps switch board. The zero energy ice making technique by the process of convection was deliberated upon.

Appropriate and sustainable technologies for rural areas by Prof. S.K. Kakoty, IIT Guwahati

Dr Kakoty mentioned that IIT, Guwahati has a Rural Technology Action Group (RuTAG) which is a mission conceptualized and initiated by Dr. R. Chidambaram, Principal Scientific Adviser (PSA) to the Government of India with the aim to improve the rural economy through appropriate S & T interventions in the traditional methods of production. RuTAG mission is to bring all Government & Non Governmental groups or stake holders together to proactively work for the development of the region so that people can derive the benefits of Research & Development in various scientific fields. He also presented the technologies developed by RuTAG that are ready for dissemination like bicycle with higher carrying capacity, eri cocoon opener, chaff cutting machine etc.

Activities of Mahatma Gandhi Institute of Rural Energy and Development (MGIRED) by Shri Punati Sridhar, Executive Director.

Shri P. Sridhar highlighted the activities of his institute and spoke on the gap between the demand and supply of power. As per 2011 census statistic only 55.3 % of the rural households and 92.7 % of the urban households were electrified. 62.5 % rural households and 20 % urban households still use firewood as cooking fuel. To solve the problem of power there has to be an appropriate blend of pico hydro, solar, micro wind and bio mass power generation. Various energy sources and biogas alternatives were presented.

Community Biogas by James Joseph Agro Machinery & Consultancy (Pvt)

Integrated & Sustainable Solid & Liquid Resource Management (SRLM)- by C. Srinivasan , Indian Green Service Vellore

Mr Srinivasan talked about turning garbage into gold and that waste when treated in time is a resource. He mentioned that waste from the households and public places are unwanted material. He cited various examples of waste treatment and deliberated on the Solid Liquid Resource Management project. The SLRM model has become a source of livelihood for the people at various stages and according to the category of waste treatment can be done to generate power, fuel, compost and organic fertilizers. He also spoke of the use of ducks for aeration of fish ponds, methods of collection of garbage from a market places etc. and cited examples on how each process generates income and useful resources.

- Decision taken – to send a team of 10 people from each SAGY village to visit the SLRM Project
- To arrange a training for Master Trainers on SLRM at the SIRD.

Renewable Materials and Green Construction – by Ulrich Wallner, Bamboo Tech, Arunachal Pvt. Ltd

Mr Wallner presented the technology that was developed by him to use bamboo as an alternative in building construction. In his presentation he displayed various types of jointing technology, pre- fabricated components, earthquake resistant buildings, insulation technique etc. Arunachali Boys in Germany

- Decision- To involve Wallner in the construction of the office space, training hall and dormitory of MSRTLPC.
- To involve Wallner in training local artisans and youth from the villages on the technology.

Organic Waste Management –by Shri K.Yadre , Myco Compost

Mr Yadre related his association with Swachh Bharat Mission and presented the various composting techniques that are being promoted by his organization.

Inducting Appropriate technologies for rural areas – CIPS perspective – Mr D. Chakrapani

Video Conferencing by Director of CIPS, Hyderabad Mr, Chakrapani (Retd. IAS)

Mr Chakrapani mentioned that there is a serious shortage of qualified medical and health professionals particularly at the District and Sub-district level hospitals. It is also well known that a number of private hospitals with a minimum of about 50-100 beds have been able to address this shortage through introduction of the courses which are offered through Diplomate of National Board (DNB), New Delhi.

Diplomate of National Board (DNB) is a Post Graduate (PG) Degree (Masters – Duration of 3 years) programme equivalent to MS/MD recognized by the Government of India. This title is awarded by the National Board of Examinations (NBE), New Delhi an autonomous academic body equivalent to the Medical Council of India (MCI) under the Ministry of Health and Family Welfare. It is a full time course and is conducted in the premises of the hospital under the guidance of senior post graduate doctors. DNB offers different courses all of which are included in the first schedule of Indian Medical Council Act 1956.

It has been noticed that very few public hospitals have so far taken advantage of the DNB Courses. The institutionalization of this course in the various hospitals at the District and Sub-district level would go a long way in addressing the needs of the PG students in medical/health sector.

If the DNB Programme is initiated at the Govt. Hospitals with a bed strength of 100 and above, it would be beneficial not only from the point of view of certification of the professionals but would also help the hospitals to retain medical practitioners in hospitals without dislocation of medical and health services. Further, the DNB Courses do not need additional infrastructure. All that is required is a small library.

West Bengal State Government has started the DNB Courses in 6 district hospitals viz., Howrah, Hooghly, Barasat, Krishna Nagar, Purulia and Asansol.

CIPS is exploring the possibility of institutionalizing the Vision Centres in Common Service Centres (CSCs) or Primary Health Centres (PHCs) in different states in association with Aravind Eye Care, Madurai and L V Prasad Eye Institute, Hyderabad.

CIPS and Aravind Eye Care, Madurai have prepared a proposal on 27.08.14 for setting up of 15 IT embedded Primary Eye Care centres (Vision centres) on a pilot basis in three districts of Jharkhand. According to the proposal, these centres would be co-located in the Common Service Centers (CSC) with the technical assistance provided by Aravind Eye Care System (AECS) and the whole process will be facilitated by Centre for Innovation in Public systems (CIPS).

One of the important innovative practices that CIPS has been trying to replicate is the Bio Digesters technology developed by the DRDO for disposal of human waste. A high level delegation consisting of Hon'ble Minister for Rural Development, Principal Secretary, Rural Development, Superintending Engineer, Public Health Engineering, Meghalaya and Director, CIPS went to Lakshadweep for a study of implementation of Bio digesters in June, 2013.

CIPS has entered into a MoU on 27th June, 2013 with Govt. of Meghalaya for the replication of Biodigesters. CIPS has facilitated a meeting at New Delhi under the Chairmanship of Dr. Manas K Mandal, Director General (Life Sciences), Defence Research & Development Organisation (DRDO) to establish further institutional linkages for implementation of Biodigesters in Meghalaya.

As a result of the efforts made by CIPS Meghalaya Government has sanctioned an amount of Rs. 10 crores for the implementation of Bio Digesters in their state. They have also recruited a team of 7 engineers, 5 of them were belonging to Civil Engineering and 2 to Mechanical Engineering branch.

The engineers recruited by Meghalaya Government have been trained at CIPS, Hyderabad in a 5 day programme in November, 2014. They have been exposed to the technology of Bio Digester procurement and their maintenance. They have also been exposed to a series of interactions with the Railway Engineers of South Central Railway who have experience in implementing this technology.

The Meghalaya Team has also been taken to the various locations where Bio Digesters have been installed in and around Hyderabad. They have subsequently been sent to Gwalior for a 3 day intensive workshop where the scientists of DRDO explained them all aspects relating to the installation and maintenance of Bio Digesters.

An innovative practice relating to the Use of Waste Plastic in Road Construction, implemented in states like Tamil Nadu, Karnataka, Himachal Pradesh and Jharkhand has been identified for replication.

CIPS is also actively engaged in disseminating information relating to the 3 Year Rural Medical Practitioners Programme which has been successfully implemented in Assam. It has resulted in substantial improvement of Health Care at Sub Centres by increasing institutional deliveries and improving outpatient services.

Following this discussion Mr K.N. Kumar, Principal Secretary, C & RD Department stated that the pilot phase for installation of Bio digesters has already started and 7 are being installed at Nongbah Myrdon. He also mentioned that introduction of the Registered Medical Practitioners Model has been taken up with the relevant Department

Development alternatives by Rajesh Khanna

Mr Khanna talked about the strategy adopted by the Development Alternatives Group. He stated that they are running businesses with the SHGs and Entrepreneurs. Development alternatives designs and fosters new relationship between technology -nature and people to attain the goal for sustainable development and believes that the key to achieve this is the creation of sustainable livelihoods in large numbers. Sustainable livelihoods implies that communities are informed and empowered with access to dignified and viable income generation opportunities and a clean and healthy environment.

The Technology and Action for Rural Enhancement (TARA) has commercially launched several technologies developed by DA, in the areas of:

- Habitat Products & Services
- Water Testing & Purification
- Energy
- Handloom textiles
- Paper recycling

Group discussion and Recommendations:

Following the presentations on the second day the participants were divided into 5 Groups to discuss the following topics:

1. Identification of Technologies with potential for Entrepreneurship/Skill development
2. Rural Constructions Technologies that can be grounded at MSRTLPC
3. Potential non construction technologies
4. Farm technologies
5. Non-Farm technologies
6. RTP – Institutional Development

Group 1: Identification of Technologies with potential for Entrepreneurship/Skill Development

The Group listed out the different technologies that have potential for entrepreneurship and skill development. The technologies identified were as follows:

- Broom making: Skill Formation for value addition
- Handicrafts (Bamboos, canes etc)
- Integrated Bamboo farming (Nursery to Final Products)
- Plate making
- Solar lamps, wind mills, water
- Fruit processing industries (pineapple, banana)
- Banana-based products
- Organic mosquito repellents making
- wood carving
- Preservation of exotic species of fishes
- Soap making from *aloe vera*
- Waste management
- Traditional healers

The Initial steps to be followed for Entrepreneurship Development as recommended by the group are stated below:

- Creating awareness to the people at the Block Level
- Preparing preliminary project profiles of the technologies and their assessment to see whether it is economically viable
- Convergence with different schemes like MNGREGA, etc.
- Creating common facility centers for cluster of villages
- Upgrading skills and products
- Branding of products is essential

Group II: Rural Construction Technologies that can be grounded at MSRTLPC

The present scene and challenges for rural housing as described by the the group were that the target beneficiary families belong to Below Poverty Line (BPL) and the quality of housing is constraint by an amount of Rs 75,000 per family. The specifications prescribed for the house is 22 sq.mt (200 sq. ft) too is enough for about two rooms as per the IAY Guidelines. There is a need to rethink the approach towards rural housing as the poor have become over dependent on subsidies. As the government's approach is socialistic and not for profit, there is a reluctance of private enterprises to venture into rural housing.

The considerations that should be taken into account to improve rural housing are:

1. Durability: where the house should last for about 15 – 20 years without repair
2. Efficiency: relating to thermal insulation that provides all season dwelling comfort
3. Use of locally available material like bamboo, mud block and broom grass material
4. There is a need to think of affordable and cost effective housing rather than low cost housing

The new approach proposed by the Group are:

1. The sustainable solution to build houses is to involve the community to build the houses.

2. There is a need to create an Entreprises and use the Human Resource effectively where there will be trained rural youth (men and women) with specialization in areas of masonry, carpentry, electrical works, plumbing and house building.
3. The use of natural resources and locally available material in the appropriate way is essential to make the houses cost effective, affordable and environmentally friendly.
4. The manufacturing manpower has to be the people themselves where the beneficiaries also contribute towards house construction.
5. The rural enterprise has to be competitive

The Group also provided a word of caution as construction contributes a large fraction to GDP and prefabricated housing from foreign companies like China will be an economic threat to India, in the future.

Group III: Potential non construction technologies for grounding in the MSRTLPC

The Group enlisted the following technologies that could be immediately grounded in the MSRTLPC

1. Handmade paper and its value added products
2. Washing powder and ecofriendly products where SHGs and entrepreneurs registered with EFC centers can be trained and encouraged for production, marketing etc.
3. Home based value added products from Horticultural produce and setting up of floriculture nurseries for making herbal beautification products
4. Cane and Bamboo crafts
5. Apiculture
6. Solar assembling unit
7. Mushroom cultivation
8. Stabilized mud block
9. Traditional Jewelry
10. Leaf plate making

11. Briquetting making products- from biomass waste/resources
12. Eri weaving & eri cultivation
13. Bamboo vinegar
14. Sanitation park

Group IV: Farm Technology

The group was of the opinion that manual and semi mechanical equipment related to agriculture, horticulture and fruit processing should be displayed and their utiliity be demonstrated live at the Rural Technology Park. Few of the farm based technologies that could be inducted at the Rural Technology Park as proposed by the group are listed below:

1. Paddy thresher
2. Weeders
3. Solar dryers for turmeric and ginger
4. Rice mill model
5. Composting and bio fertilizer units
6. Fruit processing machinery

The group also felt that indigenous crop varieties may also be collected for conservation and display purposes. The Bokashi technology for pig rearing and bee keeping may also be demonstrated at the MSRTLPC.

Group V: Non-Farm Technology

The group divided the technologies into 5 categories i. e. Mechanical, Energy, technologies that support Agriculture, health and miscellaneous.

The following technologies were recommended under each category:

1. Mechanical
    a. Bamboo technology like bridges etc.
    b. Energy efficient Ropeway that can be solar powered
    c. Building materials like bamboo, plastics, pine cones etc.

2. Energy
    a. Efficient cooking stoves
    b. Biogas plants
    c. Energy efficient and simple cold storages
    d. Micro hydro
    e. Briquetting from broom grass
3. Technologies supporting Agriculture
    a. Pumps for irrigation
    b. Solar dryers for preservation and value addition of agro-products
4. Health
    a. Technologies that will provide potable, safe and clean water
5. Miscellaneous
    a. Considering the biodiversity that exist in the North East Seed Banks may also be developed
    b. Tools and implements that support setting up of small workshops may be considered

Group VI: RTP – Institutional Development

The approach for institutional linkages and development should focus on not for profit set ups establishing strategic partnerships for the development on a long term basis (3-5 years), the ability to contribute to the enhanced "Quality of Life", need and local resource based. Thrust Drivers/ projects for each Strategic Partner may also be promoted and the projects should be such that they contribute to the utilization of local resource and assist the RTP in Capacity Building. Some of the Institutions recommended by the group are:

- ARTI, Pune
- RTP, Hyderabad
- IIT Delhi
- Development Alternative (TARA)
- MGIRED
- Special Mention and Alliance with SLRM

Decisions taken:

The following decisions were taken during the Workshop

1. A visit to the RTP run by Bethany Society should be planned immediately. The visiting team will comprise of officers to study how it was conceptualized.

Action: SIRD/MSRTLPC

2. Commission a study to customize attachment of a mould board to the power tiller so that it can also be used in winter when the soil is dry and hard.

Action: SIRD/MSRTLPC

3. Directorate of Oilseeds Research, Hyderabad can be approached to examine the oil content of broom seeds.

Action: SIRD/MSRTLPC

4. Explore the possibility of converting broom grass clumps to resources for building etc.

Action: SIRD/MSRTLPC

5. Explore the medicinal value of broom grass sap

Action: SIRD/MSRTLPC

6. MSRTLPC will consult Mr Zende for cultivation of strawberries using raised beds technology.

Action: SIRD/MSRTLPC

7. To collect the various models of improved cook stoves, Sarai stoves and cooker system from ARTI on cash-on-delivery basis.

Action: SIRD/MSRTLPC

8. A quick study visit on leaf plate making by DHRITI Barpeta should be undertaken.

Action: SIRD/MSRTLPC

9. Meghalaya Institute of Entrepreneurship team led by Project Director, DRDA Ri Bhoi will visit ARTI.

Action: MIE, SIRD/MSRTLPC

10. Send a team of 10 people from each SAGY village to visit the SLRM Project

Action: SIRD/MSRTLPC

11. To arrange a training for Master Trainers on SLRM at the SIRD.

Action: SIRD/MSRTLPC

12. To involve Mr. Ulrich Wallner in the construction of the office space, training hall and dormitory of MSRTLPC.

Action: SIRD/MSRTLPC

13. To involve Mr. Ulrich Wallner in training local artisans and youth from the villages on the technology.

Action: SIRD/MSRTLPC